

REMARKS

Claims 1-13 are pending in this application, of which claim 4 has been amended. No new claims have been added.

Before turning to the cited references, a brief review of the claimed invention is in order.

In the present invention the planar antenna and the substrate forming the superconductive high frequency circuit are arranged perpendicularly and the antenna and high frequency circuit are electromagnetically coupled via space.

With such features of the present invention, it is possible to arrange antenna elements at a high density and it is possible to produce a compact array antenna.

Claims 1, 2, 4, 5, 8, 11 and 13 stand rejected under 35 U.S.C. § 103(a) as unpatentable over U.S. Patent 5,121,127 to Toriyama (hereinafter “**Toriyama**”) in view of Hein, Matthias, “High-Temperature-Superconductor Thin Films at Microwave Frequencies”, pps. 302-305 (hereinafter “**Hein**”).

Applicants respectfully traverse this rejection.

Toriyama discloses a microstrip antenna comprising (1) a conductive planar element that is grounded to provide a ground surface, (2) a plurality of conductive, circular, radiation elements stacked from each other, the grounded conductive planar element and the conductive, circular, radiation elements being separated by a respective dielectric layer, (3) a first feed point and (4) other feed points. With reference to FIGS. 11 and 12, reference symbol 11 corresponds to a grounded conductive planar element (1), reference symbols 13 and 15 correspond to a plurality of conductive,

circular, radiation elements stacked from each other (2), reference symbols 12 and 14 correspond to dielectric layers to separate conductive elements, reference symbol 15f corresponds to a first feed point (3) and reference symbols 13f1 and 13f2 correspond to other feed points (4).

The Examiner has cited Hein for teaching the planar superconductive high frequency circuit not disclosed in Toriyama.

The Examiner has also argued that antenna 15 and dielectric layer 14 form “a planar superconductive high frequency circuit arranged in a perpendicular direction with respect to the element surface of said planar antenna.”

Applicants respectfully disagree. Toriyama fails to teach, mention or suggest at least the following features of the present invention:

1. The planar antenna and the planar superconductive high frequency circuit are not arranged perpendicular to each other, as shown in Figs. 1A and 1B of the instant application. The “circuit” formed by antenna 15 and dielectric layer 14 is certainly not perpendicular to the antenna itself, as claimed in the present invention;
2. The high frequency “circuit” of Toriyama is neither superconductive nor planar, as claimed in the instant application; and
3. The high frequency “circuit” of Toriyama is not electromagnetically coupled to the planar antenna, as claimed in the instant application.

Thus, Toriyama only describes an antenna having a plurality of conductive circular planar elements arranged parallel to each other. Toriyama fails to disclose an antenna coupling module

comprised of a planar antenna and a substrate forming a superconductive high frequency circuit arranged perpendicularly, the antenna and high frequency circuit being electromagnetically coupled as in the present invention, which enables to arrange antenna elements at a high density and to produce a compact array antenna. By making this array antenna compact, it is also possible to make the system for coupling the conductors comprised of a superconductor compact as well, so it is possible to cut the cost of antenna production and the operating cost. (Refer to page 4, lines 30 to page 5, line 3, and FIG. 1A and 1B of the instant application.)

Thus, the 35 U.S.C. § 103(a) rejection should be withdrawn.

The Examiner has indicated that claims 3, 6, 7, 9, 10 and 12 would be allowable if rewritten in independent form. Applicants respectfully defer this action until a FINAL Office Action, if any, is received.

In view of the aforementioned amendments and accompanying remarks, claims 1-13, as amended, are in condition for allowance, which action, at an early date, is requested.

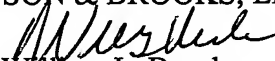
If, for any reason, it is felt that this application is not now in condition for allowance, the Examiner is requested to contact Applicants' undersigned attorney at the telephone number indicated below to arrange for an interview to expedite the disposition of this case.

U.S. Patent Application Serial No. 10/790,769
Response to Office Action dated May 2, 2005

In the event that this paper is not timely filed, Applicants respectfully petition for an appropriate extension of time. Please charge any fees for such an extension of time and any other fees which may be due with respect to this paper, to Deposit Account No. 01-2340.

Respectfully submitted,

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